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The Theory of Planned Behavior: Predicting Physical Activity in Mexican American Children

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Theoretically grounded research on the determinants of Mexican American children's physical activity and related psychosocial variables is scarce. Thus, the purpose of our investigation was to evaluate the ability of the theory of planned behavior (TPB) to predict Mexican American children's self-reported moderate-to-vigorous physical activity (MVPA). Children ($N = 475$, ages 9–12) completed questionnaires assessing the TPB constructs and MVPA. Multiple regression analyses provided moderate support for the ability of the TPB variables to predict MVPA as we accounted for between 8–9% of the variance in MVPA. Attitude, subjective norm, and perceived behavioral control accounted for 45% of the variance in intention. Descriptive results were encouraging because mean values indicated that most children had positive attitudes, moderately strong intentions, felt in control, and perceived support from significant others (i.e., physical education teachers) for their physical activity engagement.

Key Words: social cognitive theory, Latino, health, children, fitness

Understanding the antecedents of minority children's physical activity (PA) involvement is important. Minority children are less likely to engage in nonschool moderate-to-vigorous physical activity (MVPA) and PA in physical education classes (Gordon-Larsen, McMurray, & Popkin, 1999; Kann et al., 1996; Lindquist, Reynolds, & Goran, 1999) and are less fit (Lindquist et al. 1999) compared with Caucasian children. The value of regular PA is well established for adults and includes a reduced risk of colon and breast cancer (Friedenreich & Orenstein, 2002), as well as diabetes, high blood pressure, and heart disease (USDHHS, 1996). Concerning children, PA during childhood is thought to protect mostly against the development of cardiovascular disease, especially if children have abnormal risk factor values (Bar-Or & Rowland, 2004, pp. 129–130). In their study of over 4,000 children, Andersen and colleagues reported that rates of inactivity among Mexican American children were a particular "cause for concern" (Andersen, Crespo, Bartlett, Cheskin, & Pratt, 1998, p. 942). Based on 1-mile run times, 72% of 306 Hispanic female

high school students were classified as having “poor” cardiovascular fitness levels (Fahlman, Hall, & Lock, 2006).

In regards to levels of overweight, Mexican American boys, aged 6 to 11 years, have the highest rate of overweight (43.9%) among all ethnic groups (Hedley et al., 2004). Other researchers have found that Hispanic children from the inner city are overweight (38%) or are at risk (22%) for becoming overweight, which is double the national average for American children (Mirza et al., 2004). Hispanic children also have greater body mass (Brosnahan, Steffen, Lytle, Patterson, & Boostrom, 2004). Researchers examining rural Mexican American youth ($N = 401$) from the same region of the country as our study participants found average BMIs for 10-, 11-, and 12-year-old groups that all exceeded the criterion (i.e., the 85th percentile) value for classification as overweight (Guinn et al., 2006).

Researchers have also begun to investigate the psychosocial correlates of PA in Latino children. Hispanic seventh-grade children reported less total support (i.e., from family, peers, and classmates) for PA compared to African American children (Frenn et al., 2005). In a study including over 1,300 Hispanic ninth- and tenth-grade students, from mostly rural schools, Brosnahan et al. (2004) examined the relationships among PA, physical education, sadness, and dimensions of suicide. Brosnahan and colleagues found that students reporting more physical education participation were less likely to feel sad. Vigorous PA was also associated with a reduced likelihood to plan suicide. Similarly, vigorous PA is related to better social functioning among Hispanic adolescents (Allison et al., 2005). Lastly, Guinn, Semper, and Jorgensen (1997) found that Mexican American adolescent females who exercised reported more favorable self-esteem and body image compared to those reporting less exercise involvement. In summary, Latino children’s PA engagement is inadequate according to national recommendations (Strong et al., 2005; USDHHS, 1996), and few researchers have examined the PA of Latino children using established theoretical frameworks.

Clearly, understanding the determinants of PA among children from minority at-risk populations is important. Therefore, the major purpose of the current study was to examine the determinants of PA in Mexican Americans, the largest minority population in the United States (Miller, 2003; Ramirez, 2004). The U.S. federal government has defined the terms *Hispanic*, or *Latino*, as a person of Mexican, Puerto Rican, Cuban, South or Central American, or other Spanish culture or origin regardless of race (Ramirez, 2004). The terms *Latino* and *Hispanic* are often used interchangeably. Using theory to guide research is important because it provides scientists with explanations for their results, and anomalous findings aid researchers in refining theories. Unfortunately, theory-based PA and health-related research on Mexican American children are sparse. For instance, in a recent review of 20 studies on the psychosocial correlates of PA among Latinos, all study participants were adults (Marquez, McAuley, & Overman, 2004). The emerging data on Latino children’s PA engagement, however, is not encouraging. For instance, Romero (2005) examined mostly Mexican American ($n = 56$) middle-school children from the southwestern United States and found that they were vigorously active for at least 20 min about 3.5 days a week. Wolf and colleagues (1993) examined PA and ethnicity in adolescent school girls. Hispanic girls (as well as Asian) had the lowest reported PA levels and almost half (i.e., 46.7%) reported less than 1 hr per week of strenuous PA (Wolf et al., 1993). One exception to the above results is a report on

Hispanic adolescents from Minnesota who engaged in a little over 9 hr per week of PA (McGuire, Hannan, Neumark-Sztainer, Cossrow, & Story, 2002).

The theory of planned behavior (TPB; Ajzen, 1991) is a well-supported theoretical framework used to study childhood PA (Martin et al., 2005; Motl et al., 2002). According to the TPB, children with strong intentions to engage in MVPA are more likely to do so compared to children with weaker intentions (Ajzen, 1991). Intentions are thought to be influenced by social expectations (i.e., the subjective norm), people's attitudes, and perceptions of control. Children who have favorable attitudes toward MVPA are more likely to have strong intentions compared to children who have unfavorable attitudes. Thus, for instance, children who have fun (i.e., the experiential aspect of an attitude) engaging in MVPA are more likely to make plans to be active compared to children who do not enjoy MVPA. Children who perceive that significant adults (e.g., physical education teachers) expect them to engage in MVPA and are motivated to obtain the teacher's approval by complying with their expectations, are likely to have strong intentions to participate in MVPA compared to children who perceive weaker subjective norms. In other words, children who are aware of their physical education teacher's desires for them to be active, and who want to please their teachers in that regard are more likely to try to (i.e., develop an intention to) engage in MVPA compared to children who disregard their teacher's expectations and/or who are not strongly motivated to do what their physical education teacher believes is important. Finally, children who feel in control of their PA are likely to report strong intentions to perform MVPA compared to children with weaker perceptions of control (Martin et al., 2005).

Researchers have used the TPB to study PA with African American children (e.g., Martin et al., 2005) but we could find no research using it with Mexican American children although perceptions of control and intention have been examined outside the TPB (Guinn et al., 2006). In their study of African American children, Martin et al. (2005) found that subjective norm and control were both significant predictors of intention. In addition, the impact of attitude on intention was mediated by both subjective norm and control. Motl et al. (2002) also reported that both attitude and subjective norm were predictive of African American and Caucasian girls' intentions to be physically active. However, both Martin et al. (2005) and Motl et al. (2002) found that intention was not predictive of PA and suggested that children may have difficulty translating their intentions into behavior as a result of external barriers, less control of their own behavior compared to adults, and limited self-regulation skills. Cumulatively, the above research efforts with African American children indicate that the TPB may also have promise for increasing our understanding of Mexican American children's PA and related perceptions.

To address the lack of research in this area, we designed the current study. More specifically, our primary purpose was to examine the TPB constructs and their ability to predict self-reported MVPA with a population of rural Mexican American children living in the southwestern United States. Consistent with the TPB, we hypothesized that subjective norm, attitude, and perceived behavioral control would be positively related to intention. Children with favorable attitudes, strong perceptions of subjective norms, and feelings of control, all regarding MVPA, would express greater intentions to engage in MVPA compared to children reporting less positive cognitions. Consistent with the TPB, we also hypothesized that perceived behavioral control would directly influence MVPA as well as be mediated

by intentions. We next hypothesized that intentions would be the primary predictor of MVPA. In particular, in line with the TPB, we did not expect that subjective norm or attitude would directly predict MVPA but that they would be mediated by intentions. Although Rhodes and Plotnikoff (2005) indicated that current assessments of PA in cross-sectional designs are adequate proxy measures for future PA, we obtained assessments of current MVPA and assessed future MVPA (6 months later). We also had two secondary purposes. First, we sought to provide the important psychosocial descriptive data (i.e., TPB variables) on Mexican American children that is currently lacking. Our next secondary purpose was to examine whether there were gender differences favoring boys given that previous research in this area, particularly regarding children's PA, have found boys to be more active than girls (e.g., Gordon-Larsen, McMurray, & Popkin, 1999; Sallis, Zakarian, Hovell, & Hofstetter, 1996). Research ranging from Mexican American preschoolers (McKenzie, Sallis, Nader, Broyles, & Nelson, 1992) to Latino adults (Marquez & McAuley, 2006) has found higher rates of PA for males compared to females.

Method

Participants

Four hundred and seventy-five Mexican American children from the rural Southwest participated in the current study. Children ranged in age from 9 to 12 years ($M = 10.4$, $SD = .57$). However, most (96%) of the children were either 10 (60.8%) or 11 (35.2%) years old. Breakdown by gender was 50.9% female and 49.1% male. Children in the current study came from a rural border community considered one of the poorest counties in New Mexico. For instance, 68% of the children were on free or reduced lunches and just over half (52%) the children were born to single-parent families. The median income is \$13,000, which is below the poverty line for the county in which the study was conducted.

Instruments

Students were first asked to report their gender, age, ethnic background, and grade. Students then completed a brief questionnaire reflecting the TPB constructs and MVPA. All questions assessing the TPB constructs were based on guidelines provided by Ajzen (2004) and Ajzen and Madden (1986). The TPB scales were previously used in PA research with similarly aged minority children and had established validity and reliability (Martin et al., 2005).

Intention. Children responded to three items on a 7-point Likert scale. The anchors of *definitely false/definitely true* were used for the questions "I have decided to do physical activity that makes me breathe hard or feel tired tomorrow," and "I will try to do physical activity that makes me breathe hard or feel tired tomorrow." The anchor of *definitely do/definitely do not* was used for the question "I plan to do physical activity that makes me breathe hard or feel tired tomorrow."

Attitude. We used three questions suggested by Ajzen (2004) to assess attitude with scoring based on a 7-point Likert scale. Students responded to three different sets of anchors for the question "Participating in physical activity that makes me

breathe hard or feel tired is. . . ." To assess the experiential aspect of attitudes, one question was anchored with *very unenjoyable* and *very enjoyable*. To measure the instrumental, or functional, part of attitudes, we used the opposing anchors *very unhealthy* and *very healthy*. Finally, to obtain an overall evaluation, we used the anchors *very bad* and *very good* (Ajzen, 2004).

Perceived Behavioral Control. Participants were asked the following two questions: "If I want to, I can participate in physical activity that makes me breathe hard or feel tired" and "It is mostly up to me whether I participate in physical activity that makes me breathe hard or feel tired." *Strongly disagree* and *strongly agree* anchored a 7-point Likert scale.

Subjective Norm. Subjective norm was determined by examining students' perceptions of the beliefs of their physical education teachers and their motivation to comply with those beliefs. A four-item scale was created consisting of two pairs of questions. Participants responded on a 7-point Likert scale. Answers for each question in a pair were multiplied together, resulting in two numbers potentially ranging from 0 to 49. These two numbers were then added and divided by 2 to obtain a final subjective norm score potentially ranging from 0 to 49.

An example of a pair of items, with appropriate anchors, is as follows: "My physical education teacher believes that it is important that I participate in physical activity that makes me breathe hard or feel tired" (*strongly disagree/strongly agree*) and "How important is it to you that your physical education teacher believes you should participate in physical activity that makes you breathe hard or feel tired" (*not at all important/very important*).

Moderate-to-Vigorous Physical Activity (MVPA). We used one item, and two similarly adapted versions, from the Godin Leisure-Time Exercise Questionnaire (GLTEQ; Godin & Shephard, 1985). Students responded to "In an average week, during your free time, how often do you do any physical activity long enough to make you sweat (make your heart beat quickly)?" by checking one of three boxes labeled *often*, *sometimes*, or *never/rarely*, which were scored 3, 2, and 1, respectively. Two adapted questions were "In an average week *of physical education classes* how often do you do any physical activity long enough to make you sweat (make your heart beat quickly)?" and "In an average week *outside of physical education class* how often do you do any physical activity long enough to make you sweat (make your heart beat quickly)?" An overall mean MVPA score was obtained by summing the three questions and dividing by 3. The rationale for combining all three questions was to obtain an overall global measure of MVPA that corresponded to the TPB questions. The TPB items did not specify a particular context, such as in physical education or outside physical education, thus making them consistent with the global assessment of MVPA. The GLTEQ has been shown to produce reliable and valid scores with children (Sallis, 1991; Sallis, Buono, Roby, Micale, & Nelson, 1993; Sallis et al., 1996) and adolescents (Sallis et al., 1993).

Procedures

We received permission from the university internal review board, the school principals, the full-time physical education teachers, and the students' parents to conduct our study. During the month of October, trained research assistants visited

all 23 elementary schools in a rural school district in southwestern United States. All fifth-grade physical education classes in all 23 schools were visited, and students completed questionnaires assessing the TPB constructs and the MVPA scale. Students who did not specifically report their ethnicity as Hispanic American or who did not have data at the posttest were excluded from analyses. Six months later, during the month of May, the same classes were visited and the MVPA scale was completed a second time. During both data collection periods, students who provided incomplete or wrong answers (e.g., missed questions or provided unrealistic answers) were asked to clarify their answers. Questionnaires were provided only in English. In the few cases where students seemed to have difficulty and expressed a lack of understanding about a question, the teacher (who was fluent in both Spanish and English) helped clarify the meaning for that child.

Data Analysis

We examined the raw data to ensure that we analyzed only complete data from Mexican American students (i.e., students who completed the TPB and MVPA scales in the fall and the MVPA measure in the spring). We next examined the internal consistencies of the scores produced by the instruments with Cronbach’s alpha (1951). Descriptive statistics were then calculated for the scales by summing items on each scale and dividing the sum by the number of items on the scale. Finally, after examining for evidence of multicollinearity, correlational and regression analyses were performed.

Results

Internal Consistency

Coefficient alphas (Cronbach, 1951) can be found in Table 1. All scales but one were considered adequate because they equaled or exceeded Nunnally’s (1978) minimal criteria of .70. We retained perceived behavioral control, despite its low alpha value, because with a small number of items (i.e., two) alpha coefficients are often low.

Table 1 Means, Standard Deviations, Ranges, Skewness, Kurtosis, and Alpha Values for all Variables

Variable	<i>M</i>	<i>SD</i>	Min–Max	Skewness	Kurtosis	Alpha
ATT	5.38	1.42	1.0–7.0	–.92	.45	.71
SN	34.38	13.30	1.0–49.0	–.68	–.59	.77
PBC	5.62	1.46	1.0–7.0	–1.18	1.03	.54
BI	5.58	1.49	1.0–7.0	–1.15	.85	.80
Current MVPA	2.39	.52	1.0–3.0	–.52	–.38	.78
Future MVPA	2.41	.50	1.0–3.0	–.58	–.11	.72

Note. BI = behavioral intention, ATT = attitude SN = subjective norm, PBC = perceived behavioral control, MVPA = moderate-to-vigorous physical activity.

Gender Differences

A MANOVA examining for gender differences was significant, $F(6, 468) = 3,877.98$, $p < .01$, partial η^2 ; $\eta = .07$. Follow-up tests found the following: Boys reported more ($M = 2.44$) current MVPA than girls ($M = 2.33$), $p < .028$, partial η^2 ; $\eta = .010$. Boys also reported more ($M = 2.52$) future MVPA than girls ($M = 2.30$), $p < .001$, partial η^2 ; $\eta = .048$. Boys expressed a more positive attitude ($M = 5.55$) toward MVPA than did girls ($M = 5.23$), $p < .014$, partial η^2 ; $\eta = .013$. Lastly, boys indicated greater intentions ($M = 5.72$) to engage in MVPA than did girls ($M = 5.45$), $p < .043$, partial η^2 ; $\eta = .009$. There were no statistically significant differences for subjective norm or perceived behavioral control. In general, the four effect sizes ($\eta = .009, .010, .130$, and $.048$) are considered small (Cohen, 1988).

Descriptive Statistics

Means, standard deviations, minimum and maximum scores, skewness, kurtosis, and alphas for all model variables assessed are presented in Table 1. Means and standard deviations of students' scores indicate that they had very strong behavioral intentions toward engaging in MVPA and positive attitudes toward MVPA. Additionally, they were motivated to comply with their physical education teachers' wishes that they should be active, and lastly they reported a strong sense of control over their ability to engage in MVPA if they chose to. Thus, these results paint a positive psychosocial picture of Mexican American children's views of MVPA. Furthermore, when compared to African American children from the inner city, a pattern emerges with three of the four mean scores (i.e., attitude, subjective norm, and perceived behavioral control) being slightly higher than those obtained by Martin et al. (2005).

Correlations Among All Variables

Correlations among the variables (see Table 2) supported the TPB postulates as there were moderate-to-strong, and meaningful, correlations among the variables from the TPB (i.e., intention, attitude, subjective norm, and perceived behavioral control). The expected correlations among the TPB variables also provide evidence of convergent validity for our measures. Statistically significant but less meaningful

Table 2 Correlations Among All Variables

	BI	ATT	SN	PBC	Current MVPA
ATT	.63**	—			
SN	.57**	.61**	—		
PBC	.32**	.34**	.34**	—	
Current MVPA	.27**	.21**	.23**	.11*	—
Future MVPA	.15**	.18**	.17**	.07	.33**

Note. BI = behavioral intention, ATT = attitude, SN = subjective norm, PBC = perceived behavioral control, MVPA = moderate-to-vigorous physical activity.

** $p < .001$, * $p < .05$

correlations involving the TPB and the two MVPA measures were found, and the two MVPA assessments were moderately correlated.

Hierarchical Regression Analyses

We first examined the data for evidence of multicollinearity. Variance inflation factors (VIF; 1.026 and 1.022) and tolerance figures (.974 and .978) were both indicative of a lack of multicollinearity using above 10 and below .10, respectively, for VIF and tolerance criteria (Cohen, Cohen, West, & Aiken, 2003). Three hierarchical regression analyses were then conducted. Consistent with our major purpose, the first two regression analyses were conducted to evaluate how well the TPB variables predicted current and future MVPA (Tables 3 and 4). In both analyses, we first entered intention because the TPB postulates that intention is the primary predictor of behavior. In the second block, we entered control as it is thought to directly influence behavior in addition to affecting behavior through intention. In the third block, we entered the remaining TPB variables (i.e., attitude and subjective norm) because they are hypothesized to only directly influence intention with no direct path to behavior (i.e., MVPA). Finally, because of previous

Table 3 Results of Hierarchical Regression on the Prediction of Current MVPA

Step	Variable	<i>R</i>	<i>R</i> ²	ΔR^2	<i>F</i> Δ	<i>df</i>	Sig <i>F</i> Δ	β	<i>p</i> <
1	BI	.267	.071	.071	36.19	1,473	.001	.267	.001
2	PBC	.268	.072	.001	.35	2,472	.555	.028	.55
3	ATT	.283	.080	.008	2.18	4,470	.114	.025	.69
	SN							.104	.08
4	GEN	.295	.087	.007	3.47	5,469	.063	-.083	.06

Note. BI = behavioral intention, ATT = attitude, SN = subjective norm, PBC = perceived behavioral control, GEN = gender. The column heading Sig*F* Δ stands for significance of *F* change and β represents standardized beta weight.

Table 4 Results of Hierarchical Regression on the Prediction of Future MVPA

Step	Variable	<i>R</i>	<i>R</i> ²	ΔR^2	<i>F</i> Δ	<i>df</i>	Sig <i>F</i> Δ	β	<i>p</i> <
1	BI	.153	.023	.023	11.38	1,473	.001	.153	.001
2	PBC	.155	.024	.001	.32	2,472	.571	.027	.57
3	ATT	.198	.039	.015	3.68	4,470	.026	.101	.11
	SN							.087	.15
4	GEN	.287	.082	.043	22.00	5,469	.001	-.210	.001

Note. BI = behavioral intention, ATT = attitude, SN = subjective norm, PBC = perceived behavioral control, GEN = gender. The column heading Sig*F* Δ stands for significance of *F* change and β represents standardized beta weight.

reported gender differences, we entered gender last to determine whether it would have predictive value. The results from these two analyses provided moderate support for the TPB.

In the first two analyses, the TPB variables and gender predicted 8–9% of the variance in current and future MVPA. The standardized beta weights, variance accounted for, and significance of F change all suggested that intention was the major predictor of MVPA. Additionally, gender added significantly to the prediction of future, but not current, MVPA.

The third and last regression analysis was conducted to evaluate how well attitude, subjective norm, and perceived behavioral control predicted behavioral intention. Similar to the first two equations, gender was entered last to see what contribution it might make to the equation. Table 5 presents the results of this analysis. The TPB variables predicted 45% of the variance in behavioral intention. Gender was not significant. These findings are strongly supportive of the TPB. The standardized beta weights suggest that attitude followed by subjective norm were the most important variables.

Table 5 Results of Hierarchical Regression on the Prediction of Behavioral Intention

Step	Variable	R	R^2	ΔR^2	$F\Delta$	df	Sig $F\Delta$	β	$p <$
1	ATT	.671	.451	.451	128.89	3,471	.001	.427	.001
2	PBC							.080	.031
3	SN							.279	.001
4	GEN	.673	.453	.002	1.73	4,470	.189	-.045	.189

Note. ATT = attitude, SN = subjective norm, PBC = perceived behavioral control, GEN = gender. The column heading Sig $F\Delta$ stands for significance of F change and β represents standardized beta weight.

Discussion

The major purpose of this investigation was to test the ability of the theory of planned behavior to predict Mexican American children's current and future MVPA. Secondary goals were to provide important descriptive data (e.g., attitudes toward MVPA) on Mexican American children's views toward MVPA and to examine for gender differences. We found that the TPB variables predicted 8–9% of children's MVPA, similar to Trost and colleagues, who accounted for 6% of the variance in middle-school children's MVPA using the TPB (Trost, Saunders, & Ward, 2002). Based on 8–9% variance, it would initially seem reasonable to conclude that the TPB was not a particularly useful explanatory framework because 91–92% of the variance in MVPA was unexplained. However, despite that fact that 8–9% of the variance might seem trivial to many, Cohen (1988) would categorize such a finding as representative of a "medium" effect size. Given the varied and significant health benefits attributable to PA, we would also suggest that our findings are important. To illustrate the value of a relatively "small" amount of PA, Hill, Wyatt, Reed, and Peters (2003) estimated that reducing energy intake or increasing energy

expenditure by 100 kilocalories per day would stabilize weight gain in 90% of the population. In practical terms, this represents a 15- to 20-min 1-mile walk per day for most people (Hill et al., 2003). Being overweight in adolescence is also related to increased mortality for adult men and decreased functional status for women (Must, Jacques, Dallal, Bajema, & Dietz, 1992). In a study of 370 overweight adolescent females, Gortmaker and colleagues found that, 7 years later, they had higher rates of poverty, less income, and were less likely to be married compared with non-overweight women (Gortmaker, Must, Perrin, Sobol, & Dietz, 1993). In summary, from a public health perspective, the above research findings would suggest that predicting 8–9% of the variance in MVPA should not be dismissed as unimportant.

With respect to the specific variables within the TPB, we found that intention was the major predictor of current MVPA. Children with greater intentions to participate in MVPA reported more MVPA compared to children expressing weaker intentions. Consistent with TPB postulates, perceived behavioral control, attitude, and subjective norm contributed relatively little to accounting for additional variance beyond that predicted by intention. In regards to the prediction of future MVPA, gender contributed as much (4%) as did all of the variables from the TPB combined (4%). Thus, boys and children with strong intentions engaged in more MVPA compared to females and children with weaker intentions. Lastly, in the regression equation predicting intention, we found that attitude, perceived behavioral control, and subjective norm accounted for 45% of the variance and gender was not significant. Based on the beta weights, attitude and then subjective norm were the most valuable predictors of intention. Children expressing favorable attitudes toward MVPA, who perceived that their physical education teacher wanted them to be physically active, and were motivated to comply with these expectations, had stronger intentions to engage in MVPA compared to children expressing weaker attitudes and subjective norms. This particular finding is similar to Motl et al. (2002) who also found that attitude and subjective norm were predictive of children's intentions to be physically active.

The moderately high and practically similar mean levels of all variables reported by the boys and girls are encouraging as they reflect a positive view toward MVPA. The statistically significant gender differences partially reflects the large sample size and were not particularly meaningful based on the effect sizes. However, the pattern of differences—with boys reporting more “favorable” cognitions in all four variables where differences were found—is consistent with previous research. For instance, Frenn et al. (2005) found that Hispanic boys reported more vigorous physical activity than did girls.

In the current study, subjective norm was determined based on participants' perceptions of their physical education teacher. Thus, a limitation of the current research effort was our exclusive focus on the physical education teacher as a source of social influence. Hispanic cultures are collectivist, suggesting that family and friends are quite important (Triandis, Bontempo, Villareal, Asai, & Lucca, 1998). Presumably, if we had captured the influence of friends, family, and classmates, subjective norm may have played a bigger role in predicting intention, which, in turn, may have accounted for more MVPA. Marquez and McAuley (2006) found that Latino men who were less acculturated indicated higher levels of non-leisure time physical activity compared to men who reported higher levels of acculturation. Berrigan, Dodd, Troiano, Reeve, and Ballard-Barbash (2006) found a positive

relationship between acculturation and leisure time physical activity but mixed results when examining non-leisure time physical activity. Other researchers have also found that acculturation helps promote PA engagement (Abraido-Lanza, Chao, & Florez, 2005; Crespo, Smit, Carter-Pokras, & Andersen, 2001; Evenson, Sarmiento, & Ayala, 2004; Slattery et al., 2006). However, all the above studies have examined adults, so research aimed at understanding how acculturation affects children's PA is warranted.

In a similar fashion, understanding how Latino children adapt (or do not adapt) to the American sporting and physical activity culture may provide insight into their PA involvement. For instance, after walking, baseball and nonaerobic dancing were the next two highest ranked activities that Latino adolescents obtained PA from (Sallis et al., 1996). Both baseball (Regalado, 1998) and dance (Delgado & Muñoz, 1997) are important aspects of Latino culture that provide important vehicles for PA involvement.

Three other limitations also deserve brief comments. First, our participants were from one school district in the rural Southwest and were therefore not representative of Mexican American children in general, so caution in generalizing our findings is certainly warranted. Second, it is possible that the context of physical education could have some subtle social desirability elements such that children provided answers consistent with the purpose of physical education (i.e., increased PA). We attempted to negate any such biases during test administration by emphasizing the importance of truthful answers, that there were no right or wrong answers, that their responses would remain confidential, and that no one but the researchers would see their answers (i.e., their teachers or parents would not be privy to their answers). Third, in our study we combined inside physical education and outside physical education measures of MVPA to obtain a global measure of MVPA. However, future researchers may want to consider two parallel sets of TPB scales with questions (i.e., attitude, perceived behavioral control, subjective norm, and intention) specific to the context of MVPA both inside and outside physical education. By assessing the TPB constructs in this manner, researchers could determine whether the various predictors of intention and behavior exert differential influences on MVPA in school versus out of school.

In summary, to our knowledge, we have conducted one of the first studies focusing exclusively on Mexican American children's MVPA using the TPB. One of the criticisms noted by Marquez et al. (2004) in their review of research on Latino's and PA was the lack of ethnicity/race-specific analyses because many researchers combine minority groups. Additionally, within the Latino population, subgroups (e.g., Mexican American Latino vs. Puerto Rican Latino) should be identifiable (Marquez et al., 2004). Lastly, few of the studies cited by Marquez et al (2004) had large sample sizes (e.g., $N > 400$). Thus, in addition to examining an under-researched minority group, our current research effort addresses the above shortcomings.

In conclusion, two major findings warrant reiteration. First, we found moderate support for the TPB as we predicted 8–9% of the variance in MVPA and 45% of the variance in intentions. Second, although we found gender differences favoring boys on four of the TPB variables, the effect sizes for these differences were small. Both boys and girls expressed strong and favorable perceptions of subjective norms, attitudes, intentions, and feelings of control, which would seem to provide an encouraging starting point for behavior change (i.e., increased PA).

Future researchers should consider conducting intervention research designed to increase the PA of Latino children as well as qualitative research that seeks to understand the barriers to Latino children's PA. Based on the current study results (i.e., the importance of attitude), a two-pronged practical pedagogical recommendation also seems warranted. That is, efforts by teachers to make physical education "fun" and to provide "knowledge" about the benefits of PA should be supported because they target the experiential and functional components of attitudes. In turn, positive attitudes toward PA should lead to stronger intentions.

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